

The Discovery of Leadbeater's Possum, *Gymnobelideus leadbeateri* McCoy, Resident in a Lowland Swamp Woodland

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Introduction

Leadbeater's Possum *Gymnobelideus leadbeateri* was discovered in a lowland swamp woodland at Yellingbo State Nature Reserve in August 1986. Since that time, the population has been alluded to (Lindenmayer *et al.* 1989; Macfarlane and Seebeck 1991; L.C.C. 1993), and some aspects of its ecology have been investigated by Thomas (1989). This report documents the circumstances of the discovery, describes the habitat occupied by the possum at this locality and compares it with the markedly different habitats which it occupies elsewhere, and with historical site records.

Site description

Leadbeater's Possums were found at Cockatoo Swamp, 3.7 km south-west of Yellingbo P.O. (37° 50'S, 145° 29'E) at 110 metres above sea level in Yellingbo State Nature Reserve. Cockatoo Swamp is a floodplain of about 6 km long, rarely exceeding 200 m wide, and encompassing an area of approximately 170 ha. Cockatoo Creek and the lower reaches of its tributary, Maelesfield Creek, flow through this depression, seasonally inundating it with flowing water for at least ten months of most years. Water depth varies but at the time of this discovery it was approximately 50 cm.

The vegetation of the Yellingbo State Nature Reserve has been investigated in detail by McMahon *et al.* (1991). The site inhabited by *G. leadbeateri* is within a floristic community they have designated *Eucalyptus camphora* swamp woodland, sub-community 1.1. It is characterised by Mountain Swamp Gum *E. camphora*, Tassel Sedge *Carex fascicularis* and Soft

Twig-sedge *Baumea rubiginosa*. *E. camphora* is the sole eucalypt of the floodplain and at this location it grows densely forming an interconnected canopy at heights varying from 12 to 25 m. Bole diameters at breast height of these trees generally range from 10 to 30 cm. The ground layer is composed of a prolific variety of sedges, reeds and herbs. A distinct thicket community, *Leptospermum lanigerum* Woolly Tea-tree shrubland, grows along permanent channels through the swamp. Two other *E. camphora* sub-communities occur in the Cockatoo Swamp basin, as do other shrub alliances dominated by Scented Paperbark *Melaleuca squarrosa* and Swamp Paperbark *M. ericifolia*.

Despite its small total area, the *E. camphora* woodland community of Cockatoo Swamp is the largest patch of this community known to exist (McMahon and Franklin 1993). McMahon *et al.* (1991) consider it to be of national significance for both its rarity and its essentially undisturbed condition.

Discovery of Leadbeater's Possum

The population of the Helmeted Honeyeater *Lichenostomus melanops cassidix* is under investigation at Cockatoo Swamp. Canvas hides have been used for some observation of the bird's nesting behaviour. In 1985 a hide was folded and left at the site for future use. It was positioned on the trunks of some fallen Mountain Swamp Gums about 70 cm above the ground.

On 25th August 1986, finding this hide to be only 20 cm above water level, G.J. Covington checked its condition at 1540 hrs. He and the author examined a nest composed of strips of *E. camphora* bark, which was found between the horizontal folds of the canvas. The nest was ap-

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proximately 35 cm in diameter and 12 cm deep. Four possums ran from the nest, whilst one remained within it. This animal was hand-caught, identified as *G. leadbeateri* and released. On 26th August the nest was revisited and was vacant at 1100 hrs.

Efforts were made to obtain further evidence of the existence of the species there. On 29th August 30 hair sampling tubes (after Suckling 1978), and seven nest boxes were positioned within a radius of 40 m of the original find. Five boxes were cleaned plastic ICI chemical containers with internal dimensions of approximately 30 cm high, 30 cm wide and 25 cm deep. Two boxes were made of sawn treated pine with internal dimensions of 30 cm high, 28 cm wide and 10 cm deep. All were fitted with removable wooden lids and had 4-5 cm diameter entrance holes. The nest boxes were erected at an average height of 4 m on the south side of *E. camphora* trunks.

On 1st September 1986 at 1300 hrs, one wooden box was found to be filled to a depth of about 10 cm with strips of *E. camphora* bark similar to those from which the original nest was constructed. This box was checked again at 1345 hrs on 3rd September and found to contain five Leadbeater's Possums in a nest which now virtually filled the box. Three animals (a mature female and two young males) were examined and photographed. One young male was retained for examination and was ear-tagged and released back at the site on 5th September.

On 16th January 1987 the same nest box was found still to contain animals, although they were not counted. They included a fully furred juvenile male with eyes open, approximately 120 mm in length from snout to tail-tip and which was not on a nipple when found. A juvenile was still present when a more thorough examination of all the animals in the box was carried out on 5th March 1987. Three males, two of mature size and one sub-adult, and two females, one mature and one probably immature, were

there in addition to the juvenile. The mature female was lactating, with one nipple enlarged. All of the possums from the box were ear-tagged on that occasion.

All nest boxes have been checked occasionally since then, and Leadbeater's Possums have been seen in a number of them up to the time of writing, in May 1994.

During a seven month period of 1989 Thomas (1989) studied the spatial distribution, population dynamics and social organisation of Leadbeater's Possum in a three hectare area of Cockatoo Swamp which included the colony found in 1986. Her study site was also inhabited by a second colony, and she found that these two groups interacted both with each other and with a further two from areas adjacent to her study site.

There is evidence that *G. leadbeateri* is distributed along a much greater length of Cockatoo Swamp. In October 1989 M. Miller (Healesville Sanctuary) examined an abandoned nest of shredded bark in a fallen eucalypt, approximately 1.5 km downstream from the first colony. It was consistent with those constructed by Leadbeater's Possums in the nest boxes (M. Miller *pers. comm.* 1989). In September 1990, D. Franklin, M. Miller, R. Edwards and S. Vaartjes (Department of Conservation and Natural Resources and Healesville Sanctuary) observed three Leadbeater's Possums in Cockatoo Swamp, at Macclesfield Ck., 1.6 km upstream of the first location. The animals emerged from, and then returned to, a drey approximately seven metres high in a *Melaleuca squarrosa* thicket. (D. Franklin *pers. comm.* 1990). The drey was typical of the twig structures of Common Ringtail Possums *Pseudocheirus peregrinus* which are very common there, but with the addition of much shredded eucalyptus bark when examined a few days later by the author. In February 1993 two Common Ringtail Possums emerged from this drey when it was checked by the author.

Comparisons with other sites and records

Since the rediscovery of Leadbeater's Possum in 1961 (Wilkinson 1961) it has been found at numerous sites within the Victorian Central Highlands where it is restricted to moist, montane, ash-type forests at elevations between 520 and 1200 metres above sea level (Lindenmayer *et al.* 1989, 1990). These forests are dominated by Mountain Ash *Eucalyptus regnans*, Alpine Ash *E. delegatensis* or Shining Gum *E. nitens*. In such forests the distribution of the possum is positively correlated with both a dense understorey of *Acacia* spp. and large hollow-bearing eucalypts (Lindenmayer 1989).

A number of the key requirements identified for Leadbeater's Possum in montane forests are not present at the site they inhabit at Cockatoo Swamp. *E. camphora* at this location have no hollows and the occupation of both a canvas hide and the ready utilisation of nest boxes indicates the paucity of natural nest sites within the swamp itself. The terrace on the immediate edge of the swamp supports some hollow-bearing Green Scentbark *E. ignorabilis*, Swamp Gum *E. ovata* and Narrow-leaved Peppermint *E. radiata*. Thomas (1989) found one active Leadbeater's Possum nest in each of these three species.

Smith (1984b) studied the diet of Leadbeater's Possum in *E. regnans* forest. He considered that *Acacia* exudates formed a very significant portion of the animals' diet in that environment. *Acaciae* are an insignificant component of the *E. camphora* swamp woodland sub-community in which the possum lives at Cockatoo Swamp and are only represented by occasional specimens of Blackwood *A. melanoxydon*, Sallow Wattle *A. mucronata* and Silver Wattle *A. dealbata* are found in the drier vegetation communities adjacent to the swamp, but not in dense stands. However, other sources of dietary carbohydrates which Smith found to be important, such as honeydew

and manna, are present within this *E. camphora* woodland.

Thomas (1989) found that the spatial distribution, abundance and social organisation of the possums she studied at Cockatoo Swamp were similar to those reported for montane ash forests.

There is only one previous record of *G. leadbeateri* specifically from a lowland swamp. It is a specimen in the Museum of Victoria collection (no. C4378), donated by F.V. Mason who collected it in 1909. Brazenor (1932) records Mason's information about the animal, 'It was taken many years ago... from the edge of Koo-Wee-Rup Swamp (long before the swamp was drained), about three miles due south from Tynong Railway Station. We were felling a tree and as it fell the little animal came from a hollow branch. I had never seen one before, though we had lived for many years on the place.'

Mason's location is at 38° 07'S, 145° 37'E and at approximately 20 metres above sea level. It is 32 km south of Cockatoo Swamp. Commencing in 1857, Koo-Wee-Rup Swamp was progressively drained and cleared of natural vegetation (Roberts 1985). The alienation of Koo-Wee-Rup Swamp was so thorough, in fact, that consideration of its former vegetation is rather speculative (McMahon *pers. comm.* 1993). However, remnant *Melaleuca ericifolia* and *Eucalyptus ovata* (Opie *et al.* 1984) as well as anecdotal historical information (Roberts 1985) indicate close similarities of floristics and structure between the vegetation communities it supported then and those present today at Cockatoo Swamp.

Loyn and McNabb (1982) have discussed the Koo-Wee-Rup Swamp record following their finding of *G. leadbeateri* in montane vegetation of the upper reaches of that swamp's catchment. They considered it, 'a perplexing record as it comes from lowland forest (now cleared) very different from habitats known to be used by the possum at present.' They postulated that, 'Perhaps the Tynong animal

could have moved into lowland forest in response to population pressures, or temporary habitat changes in the mountain ash forest.' The existence of Leadbeater's Possums resident in Cockatoo Swamp demonstrates that the animal is not reliant exclusively upon montane forests and that such an explanation for the Tynong record is unnecessary.

Three historical specimens came from Bass River (M.V. nos. C4379, C438, C1965). The first two of these are the type specimens. Exactly where on the river they, or the third, was obtained, is uncertain. McCoy's (1867) description states simply that the types were from 'the scrub on the banks of the Bass River in Victoria.' Kemp (1979) says that they were collected by J. Peters, 'near the village of Woodleigh in the Bass Valley'. The Bass River rises at about 280 metres above sea level near Ranceby and Woodleigh is situated at an elevation of about 50 metres. Hence, whilst uncertainty about the exact location obviates any meaningful comment about the vegetation community inhabited by the possum there, the elevation from which they came is much more like that of Cockatoo Swamp than the elevations at which it lives in the Central Highlands.

Thomas (1989) and Macfarlane and Seebeck (1991) have both suggested the need for further study of the Leadbeater's Possum population described here. Initially a broad survey of its distribution in this area is clearly warranted. Whilst it is of considerable interest that the animal exists in this habitat, it is also unfortunate that lowland eucalypt swamp communities are themselves so rare that the present record adds little to the conservation status of Leadbeater's Possum.

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